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Mr. Smith, in conclusion, drew the attention of the Academy to the circumstance that those and many other venerable and most interesting remains of remote antiquity, which are but rarely, and at distant intervals of time, discovered in Great Britain, and on the Continent, literally abound in Ireland; and hence inferred, the incalculable advantage which will be attained, in the study of the ancient history not only of this country but of the world, by the formation of a great National Museum of Irish Antiquities, such as is at present projected to be formed under the auspices of the Academy.

" Without claiming any undue importance for the pursuit of antiquarian research, it nevertheless has its office, and that by no means an ignoble one, as the handmaid of history—'Principatum non habet; ancillari debet.' It furnishes the critical student not only with curious information and the most valuable commentary on minute points, but summons up for him a host of most important witnesses, whom, though silent, he can subject to the most scrutinizing examination again and again; on whose testimony, carefully weighed as to its true value, history ever rests as on its securest basis."

The reading of a paper by the Rev. T. R. Robinson, D. D., " On the Constant of Refraction, determined by Observations with the Mural Circle of the Armagh Observatory," was commenced.

A paper by Dr. Andrews of Belfast, " on the Heat developed during the Combination of Acids and Bases," was read.

The general conclusions at which the author arrives are contained in the two following Laws.

Law 1. " The heat developed during the union of acids and bases is determined by the base, and not by the acid; the same base producing, when combined with an equivalent of different acids, nearly the same quantity of heat, but different bases a different quantity."

Law 2. " When a neutral is converted into an acid salt, no change of temperature occurs."

In the commencement of the paper a preliminary experiment is described, the object of which is, to determine the exact quantity of heat evolved during the combination of nitric acid and potash. The solutions, both acid and alkaline, were taken so weak in this and all the other experiments detailed in the communication, that subsequent dilution with water did not produce any change of temperature. On neutralizing the solution of caustic potash, containing 0·353 grammes of pure alcali, with nitric acid, the temperature of the resulting solution of nitrate of potash, whose weight amounted to 30 gr., was found (after all corrections had been made) to rise 6·75°,F.

To illustrate law first, the author adduces tables which shew, at a glance, the heat produced when an equivalent of each base is neutralized by different acids. Thus, when the same proportion of pure potash is combined under similar circumstances with the arsenic, phosphoric, nitric, boracic, hydrochloric, hydriodic, and oxalic acids, the elevations of temperature, indicated by the thermometer, vary only from 6·8° to 6·6°. Sulphuric acid produces rather a higher temperature than any other acid (7·3°), and the acetic, formic, tartaric, citric, and succinic acids, give rather less heat than those before mentioned (from 6·4° to 6·1°) In like manner, ammonia produces an increase of temperature varying from 5·7° to 5·5°, when neutralized by the nitric, hydrochloric, hydriodic, arsenic, oxalic, and acetic acids ; the greatest divergence from these numbers occurring, on the one hand, with the sulphuric acid (6·3°), and on the other, with the citric, tartaric, and succinic acids (5·1°). Analogous results are described as having been obtained with other bases, such as soda, barytes, magnesia, lime, and the oxides of zinc and lead. On the contrary, the heat developed by each base is peculiar to itself; and, consequently, the same acid gives different elevations of temperature, with equivalents of different bases. To take, as an example, the nitric acid, which also produces very nearly the mean quantity of heat given by all the acids, the following numbers express the increments of temperature obtained on combining the same quantity of it with each base: magnesia, 8·1°; lime, 7·2°; barytes, 6·9°; potash, 6·8°; soda, 6·5°; ammonia, 5·6°; oxide of zinc, 4·8°; oxide of lead, 4·2°; oxide of silver, 3·2°. The numbers for barytes, potash, soda, and ammonia, are strictly comparable with one another (except a slight correction for differences in the specific heats of the solutions;) but in the case of the other bases, an absorption of heat, unknown in amount, takes place in consequence of their conversion from the solid to the fluid state. Hence the numbers for these bases are all below the truth.

Two singular anomalies are described as occurring in the combinations of the peroxide of mercury with the hydracids, and in those of the hydrocyanic acid with the bases.

In confirmation of the second law the author adduces a series of experiments, which prove, that during the conversion of a neutral into a supersalt no heat is produced. Thus while the normal development of heat occurs when a solution of caustic potash is neutralized by oxalic acid, the subsequent additions, first of one, and afterwards of two more atoms of the same acid, so as to convert the neutral oxalate into the binoxalate, and the latter again into the quadroxalate of potash, is not accompanied by any change of temperature in the solutions. In testing the accuracy of this law, it is necessary to select examples where all the compounds are soluble in water, otherwise the heat arising from the formation of precipitates would interfere with and complicate the result.

The second law does not extend to the case of the conversion of neutral into basic compounds,—a part of the subject which the author has carefully investigated.